

# **NASJRB Willow Grove**

**Restoration Advisory Board (RAB)**

**17 June 2020**

# Agenda



- **Welcome**
- **RAB background**
- **Environmental Restoration Status**
- **Per- and Polyfluoroalkyl Substances (PFAS)**
- **Future RAB meeting schedule**

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# ***RAB Meeting Background***

- **A Restoration Advisory Board (RAB) is a stakeholder group that meets on a regular basis to discuss environmental restoration at a specific property that is either currently or was formerly owned by Department of Defense (DoD), but where DoD oversees the environmental restoration process.**
- **RABs enable people interested in the environmental cleanup at a specific installation to exchange information with representatives of regulatory agencies, the installation, and the community.**
- **RABs may only address issues associated with environmental restoration activities.**
- **Health related issues are not addressed by the RAB. Health agency professionals will be available after the Navy and Air National Guard Environmental Restoration presentations.**

**Source: DoD RAB Rule Handbook**

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# **Environmental Restoration Status**

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# Site 3 and Site 12 Landfills



- **Two former landfills, Remedial Investigations showed:**
  - Elevated levels of metals and PAHs in surface and subsurface soils.
  - Site 3 groundwater has low levels of PCE.
- **Proposed Remedial Action Plans (PRAPs)**
  - **Navy is addressing EPA comments on the Draft-Final PRAPs.**
    - Site 3 PRAP will be for soil with no additional action for groundwater.
    - Site 12 PRAP will be for soils only. Additional sampling planned to assess need for groundwater remedy.
  - **PRAP Public Comment Plan (Impacted by COVID-19)**
    - 45 day public comment period, dates TBD. Written comments will be encouraged to minimize community contact.
    - Public meeting date TBD. Meeting may be virtual.

**Public comment period and meeting delayed due to COVID-19**

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# Site 5 Groundwater

## Remedial Action



- Anaerobic bioremediation system continues to operate successfully.
- Annual performance monitoring is being conducted in accordance with approved Operation, Maintenance, and Monitoring Plan.
  - March 2020 – Quarterly performance monitoring was performed.
  - May 2020 – Annual performance monitoring was performed.
  - May 2020 – Additional injections of amendments was performed.
- Results continue to show good conditions for biodegradation of volatile organic compounds (VOCs) and decreasing trends of VOCs.
- Addition of amendments will now be conducted twice per year to ensure consistent conditions are maintained.

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# **Per- and Polyfluoroalkyl Substances (PFAS)**

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# Summary of Drinking Water Actions



Sampling was previously suspended since March due to COVID-19. Resuming by late June with COVID-19 screening for homeowners and sampling technicians.

- The Navy has provided funds to HWSA for filtration system costs and drinking water connections above the HA. The total funding is over \$18 million. Additional funds were provided in 2019.
- The Navy has funded filtration systems at five Horsham Water and Sewer Authority (HWSA) public wells (#10, 17, 21, 26, and 40) which were found to be above the HA. All are back to drinking water service.

Private well sampling <small>(change is from Dec. 2019 RAB meeting)</small>	Current	Change
Private wells sampled for PFOA/PFOS *	512	+0
Private wells above lifetime HA (>70 ppt)	104	+3
Private wells not yet connected **	12	+5
Private wells below HA/monitored (>40 ppt) ***	65	+6

\* Includes 47 wells sampled in Warrington, now managed by Air National Guard

\*\* This include rejected connection offers and connections in progress

\*\*\* Some monitored wells are now below 40 ppt

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# Private Drinking Water Well Sampling Area

Private drinking water well sampling for PFOA/PFOS and provision of bottled drinking water is being performed by Tetra Tech, a U.S. Navy contractor.

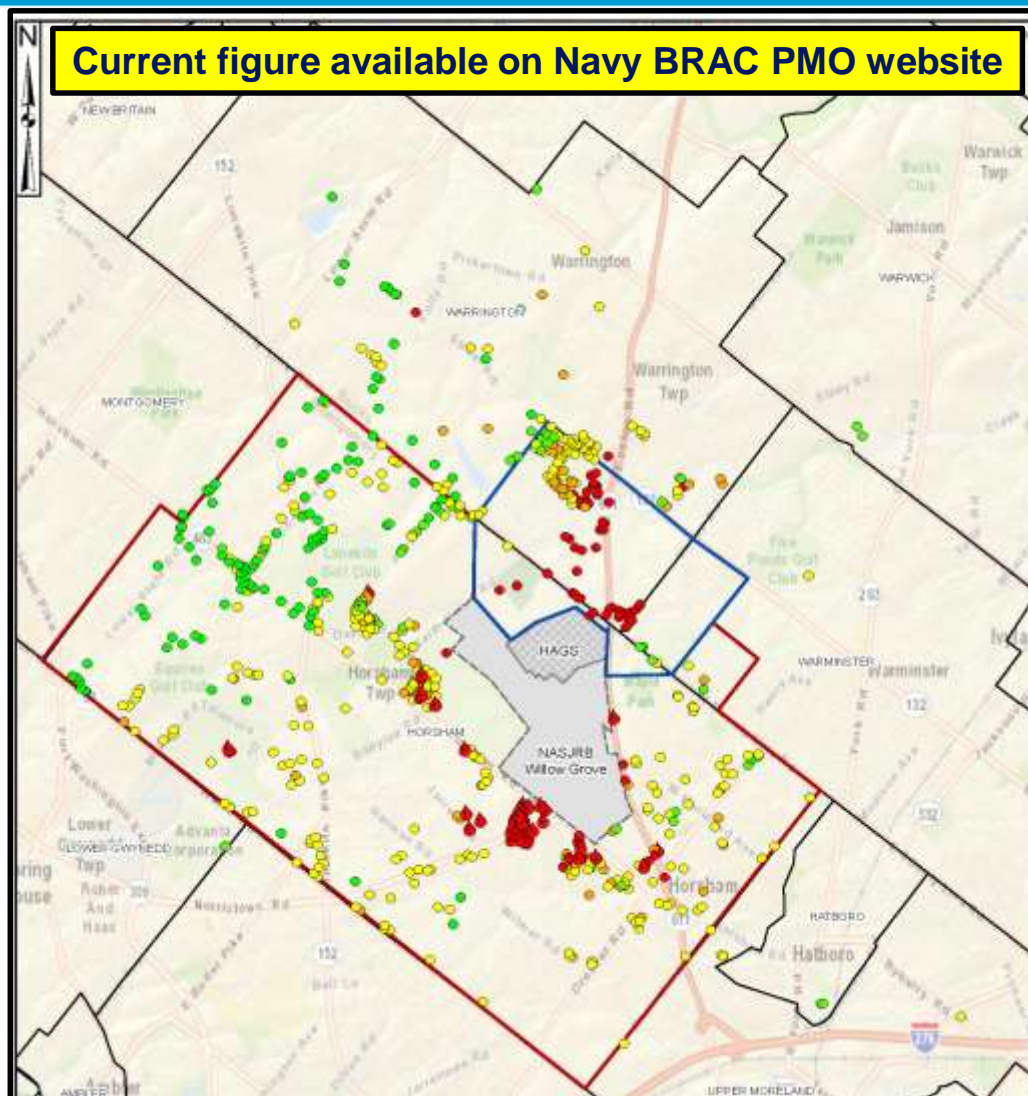
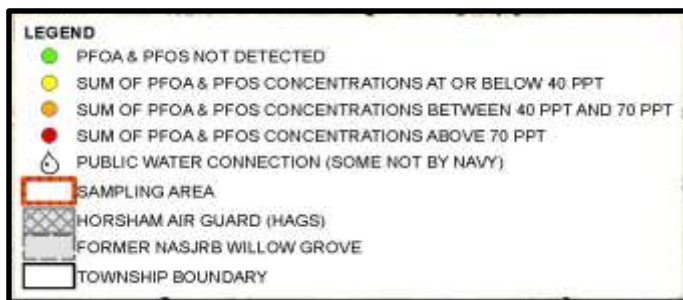
Point-of-contact is:

Tricia Moore

Tetra Tech Project Manager

[tricia.moore@tetrattech.com](mailto:tricia.moore@tetrattech.com)

Phone: (610) 382-1171



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# ***Phase I PFAS Investigation***

- **The Navy performed a Remedial Investigation (RI) to better understand the nature and extent of the PFAS contamination, and facilitate evaluation of potential remedies.**
- **October 2019 - Final Phase I RI Report completed. Available online at Horsham Library information repository and the Navy administrative record.**
- **A number of data gaps were identified that will be addressed in Phase II.**

Horsham Township Library Information Repository  
<http://oldhtl.mclinc.org/WillowGroveNASindex.html>

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## ***Phase II PFAS Investigation***

- **PFAS Phase II investigation includes, but is not limited to:**
  - **Periodic surface water and sediment monitoring.**
  - **Evaluation of groundwater extraction and treatment systems using pilot test information.**
  - **Additional monitoring wells and soil sampling in source areas.**
  - **Limited evaluation of PFAS treatment technologies**
  - **Sampling of off-base monitoring wells.**
  - **Further evaluation of on-base storm water systems.**

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# ***Phase II PFAS Investigation***

## ***Surface Water Monitoring***



- Results from July and October 2019 sampling events have been posted to BRAC PMO website. January 2020 round (3<sup>rd</sup> Round) of surface water monitoring was completed, with support from the USGS. Validated results will be posted to BRAC PMO website.
- May 2020 – fourth round of sampling completed, results are being validated. Drinking water purveyors were invited to participate.
- Navy is funding USGS to install additional stream gages to assess mass loading at select sampling locations.
- The Navy will continue quarterly sampling through the summer and will coordinate future surface sampling with the Air National Guard.

Sampling results from the first three rounds are similar to previous results

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# ***Phase II PFAS Investigation***

## ***Groundwater Treatment Pilot Tests***



### **• Pilot Test at former Aircraft Maintenance Hangar 680**

- September 10, 2019 – Startup testing initiated. Treated water was stored until confirmation that discharge limits are met.
- October 2019 to February 2020 – An investigation for the phenol detection was conducted.
- February 20, 2020 – PADEP approved the temporary discharge (6-month) permit. Stored, treated water was discharged.
- March 2, 2020 – Full-time operations commenced. More than 2.8 million gallons of water have been treated to date. Influent ranges from approx. 20,000 up to 35,000 ppt for PFOA and PFOS. The effluent meets all discharge requirements.
- Ten additional extraction/monitoring points installed in April 2020.
- An extension to the PADEP discharge approval, to operate after August 2020, will likely be requested.

Pilot tests provide valuable groundwater and treatment information for design of a full-scale treatment system.

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# Phase II PFAS Investigation

## Groundwater Treatment Pilot Tests (cont.)



More than 2.8 M gallons treated to date. Effluent meets all discharge requirements since operations commenced on March 2<sup>nd</sup>. Influent PFOA+PFOS ranges from approx. 20,000 up to 35,000 ppt.

Location of Hangar 680 treatment system

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# ***Phase II PFAS Investigation***

## ***Groundwater Treatment Pilot Tests (cont.)***



2<sup>nd</sup> Pilot Test – Will be located near Horsham Road close to FAA radar.

- **Pilot Test at former Fire Training Area (Site 5)**

- The former fire training area (Site 5) has elevated levels of PFOA and PFOS in the groundwater, and is a likely source area due to historical activities.
- An in-situ bio-stimulation remedy is operating successfully to reduce VOCs.
  - PFAS extraction wells and treatment cannot interfere with that remedy.
  - Extraction wells will likely be between the VOC plume and the base boundary.
- The draft work plan is planned to be submitted to regulators in June 2020. The work plan uses lessons learned from the Hangar 680 pilot test.

Pilot tests provide valuable groundwater and treatment information for design of a full-scale treatment system.

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# ***Phase II PFAS Investigation***

## ***PlumeStop Design Verification Test***



- A workplan for a PlumeStop Design Verification Test at the Northern Pondered Area was submitted to the EPA and PADEP in January 2020. The purpose of the study is to evaluate the feasibility of PlumeStop as a permeable reactive barrier (PRB) along the Keith Valley Road property line.
- PlumeStop is an in-situ (in ground) technology composed of very fine particles of activated carbon suspended in water through the use of unique organic polymer dispersion chemistry.
- The test is planned for a phased approach:
  - Phase I – Overburden groundwater and soil study
  - Phase II – PlumeStop injection test
- Phase I occurred in late March 2020. Results are being evaluated before Phase II can proceed.

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# ***Phase II PFAS Investigation***

## ***Other plans***



- **Other plans in development:**
  - **Draft Sampling and Analysis Plan (SAP) for off-site groundwater monitoring wells.**
    - Draft prepared July 2019.
    - Regulator comments received and being reviewed.
    - HWSA has offered access to several observation wells.
    - Currently coordinating scope of work and access with HWSA.
  - **Draft Sampling and Analysis Plan (SAP) for on-base groundwater wells and soil are anticipated in 2020.**

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# Stormwater System Evaluation



- The NASJRB storm water system was evaluated to locate portions where PFAS impacted groundwater may infiltrate and discharge to local surface water. Over two miles of storm sewer lines reviewed, using remote video inspections in the fall of 2018.
- A technical memorandum identifying leaking storm sewer lines was completed in March 2019. A copy was provided to the Horsham Township Library.
- The Navy has awarded a contract to carry out the report recommendations. Work began in November 2019 with video inspection of an additional 2 miles of sewer lines. The Tech Memo is being finalized.
- Repairs planned to commence in Summer 2020.

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# ***Action Summary since previous RAB***

- **Actions completed**
  - Completed May 2020 round of surface water monitoring.
  - Completed Site 5 quarterly performance monitoring.
  - Resumed private well sampling, suspended due to COVID-19.
  - Continued operations of the Hangar 680 pilot test system.
  - Installed 10 additional extraction/monitoring wells at Hangar 680.
- **Actions soon to be completed**
  - Site 3 and 12 PRAP public comment period and meeting.
  - Evaluate extension of Hangar 680 pilot test system operations
  - Draft work plan for Site 5 PFAS groundwater pilot test.
  - Aug/Sep surface water (5<sup>th</sup> round) monitoring.
  - Initiate storm water system repairs

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# *Next RAB Meetings*

- **Dates**

- **Wednesday, September 16, 2020 at 6:00 pm.**
- **Wednesday, December 2, 2020 at 6:00 pm.**

- **Location**

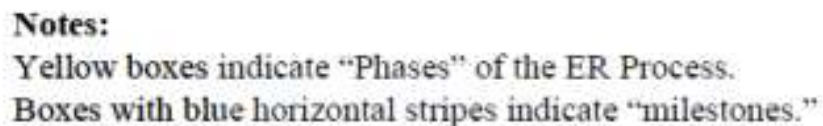
- **Meetings normally scheduled at Horsham Library, if available. Virtual RAB may continue if COVID-19 restrictions continue.**

**RAB information available at the NASJRB Willow Grove website:**  
[https://www.bracpmo.navy.mil/brac\\_bases/northeast/reserve\\_base\\_willow\\_grove.html](https://www.bracpmo.navy.mil/brac_bases/northeast/reserve_base_willow_grove.html)

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## **Back-up / Additional Information**

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*Naval Facilities Engineering Command*

# Environmental Restoration Sites



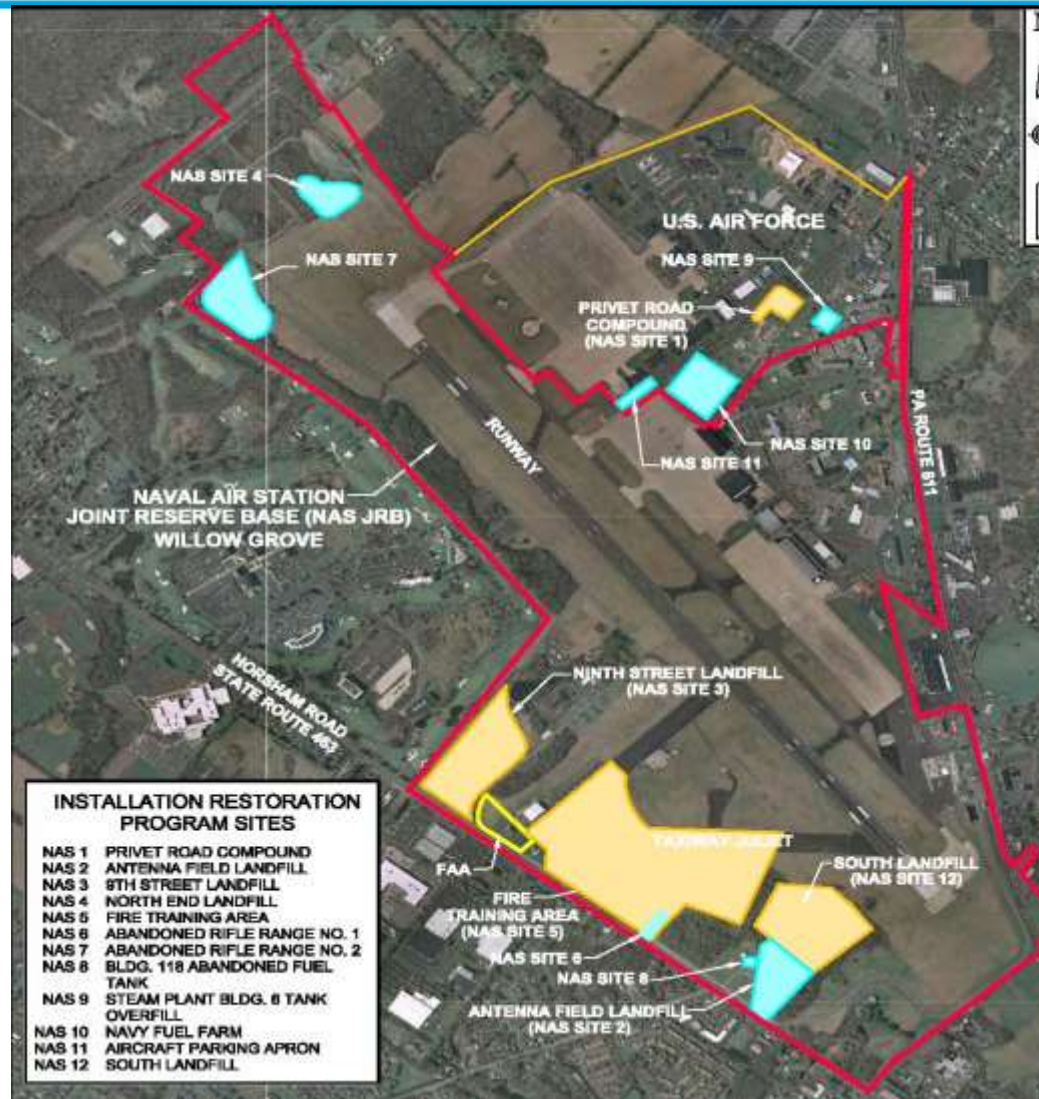
Site	Name	Operable Unit (OU)	Status
2	Antenna Field Landfill	Soil - OU 5 Groundwater - OU 9	No Action ROD Signed June 17, 2010
3	Ninth Street Landfill	Soil - OU 6 Groundwater - OU 10	RI Completed Oct. 2011/FS Pending
4	North End Landfill	...	Consensus Agreement for No Action Jan. 2009
5	Fire Training Area	Soil - OU 4 Groundwater - OU 2	Soil (OU 4) NFA ROD signed Sept. 2007 Groundwater (OU 2) ROD signed Sept. 2012 Groundwater (OU 2) RACR Signed Sept. 2014 Groundwater (OU 2) Final OPS and OM&M Plan May 2015
6	Abandoned Rifle Range No. 1	...	Consensus Agreement for No Action Dec. 2007
7	Abandoned Rifle Range No. 2	...	Consensus Agreement for No Action Aug. 2008
8	Building 118 Abandoned Fuel Tank	...	NFA Agreement Oct. 2006
SSA 11	Aircraft Parking Apron	...	Eliminated From Consideration
12	South Landfill	OU 11	Final RI Feb. 2014, FS to follow
PFCs/PFAS	Perflourinated Compounds/Per- and Polyfluoroalkyl substances	OU 12	TCRA Sept. 2015, Final PA/SI Mar. 2016, RI in progress.

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# NASJRB Willow Grove

## Environmental Restoration Sites



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# ***PFOA / PFOS Background***

- In mid-2014, PFCs known as Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) were found in public drinking water wells near NASJRB Willow Grove through an EPA program known as the Unregulated Contaminant Monitoring Rule (UCMR).
- The health advisory levels at that time were 0.4 micrograms per liter ( $\mu\text{g/L}$ ), or 400 parts-per trillion (ppt), for PFOA and 0.2  $\mu\text{g/L}$ , or 200 ppt, for PFOS.
- PFOA/PFOS are man-made chemicals used in many products, including fire-fighting solutions known as aqueous film-forming foam (AFFF), which were used at NASJRB Willow Grove.
- In the summer of 2014, the Navy began sampling for PFOA/PFOS in private drinking water wells and worked with Horsham Water and Sewer Authority (HWSA) on the municipal drinking water wells.

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# ***PFOA / PFOS Background (cont.)***



- In May 2016, the Environmental Protection Agency established a lifetime Health Advisory (HA) level of 70 parts-per-trillion (0.07 µg/L) for combined PFOA and PFOS.
- The Navy's priority continues to be eliminating exposure to PFOA/PFOS above health advisory levels in drinking water.
- Any health concerns should be addressed with your health professional. Weblinks to health information is provided at the end of this presentation.

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# ***Private Drinking Water Well Sampling***

## ***Laboratory Accreditation***



### **PFAS Laboratory accreditation**

- The Navy uses laboratories that are both accredited by the Department of Defense and Pennsylvania Department of Environmental Protection (PADEP) for EPA method 537, for drinking water.
- In September 2019, the laboratory was suspended by PADEP for method 537. Preliminary results, from sampling from Sep. through Oct. 2019, did not show exceedances of the PFOA/PFOS LHA levels.
- The Navy selected different laboratories, properly accredited with the new EPA method 537.1, in November 2019. The Navy will use EPA method 537.1 for all future sampling. The Navy is re-sampling private drinking water wells impacted by the suspended accreditation. A letter was provided to impacted property owners.
- Resampling delayed by COVID-19 but resumed in June 2020.

**For more information:**

<https://www.epa.gov/pfas/epa-drinking-water-laboratory-method-537-qa>

<https://www.denix.osd.mil/edqw/accreditation/home/>

<https://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

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# ***Phase I PFAS Investigation Summary***

- **Soil, groundwater, and surface water samples were collected in potential sources area.**
- **Human health screening assessment:**
  - **PFOS or PFOA sample results exceeding screening levels were detected in the soil, groundwater, and surface water.**
  - **The sediment samples did not contain any exceedances of the PFOS or PFOA screening levels.**
  - **PFBS detections did not exceed any screening level for any of the environmental media.**

# ***Phase I PFAS Investigation Summary***



- **Ecological screening assessments:**
  - **Screening levels for PFAS have not been developed by EPA, so the Navy identified criteria and performed the screening assessment based on a review of available literature.**
  - **PFOS or PFOA sample results exceeding these screening levels were detected in the soil and surface water.**
  - **The sediment samples did not contain any exceedances of the PFOS, while no screening benchmark is available for PFOA.**
  - **PFBS detections did not exceed any screening level.**

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# *Pilot Test Treatment System*

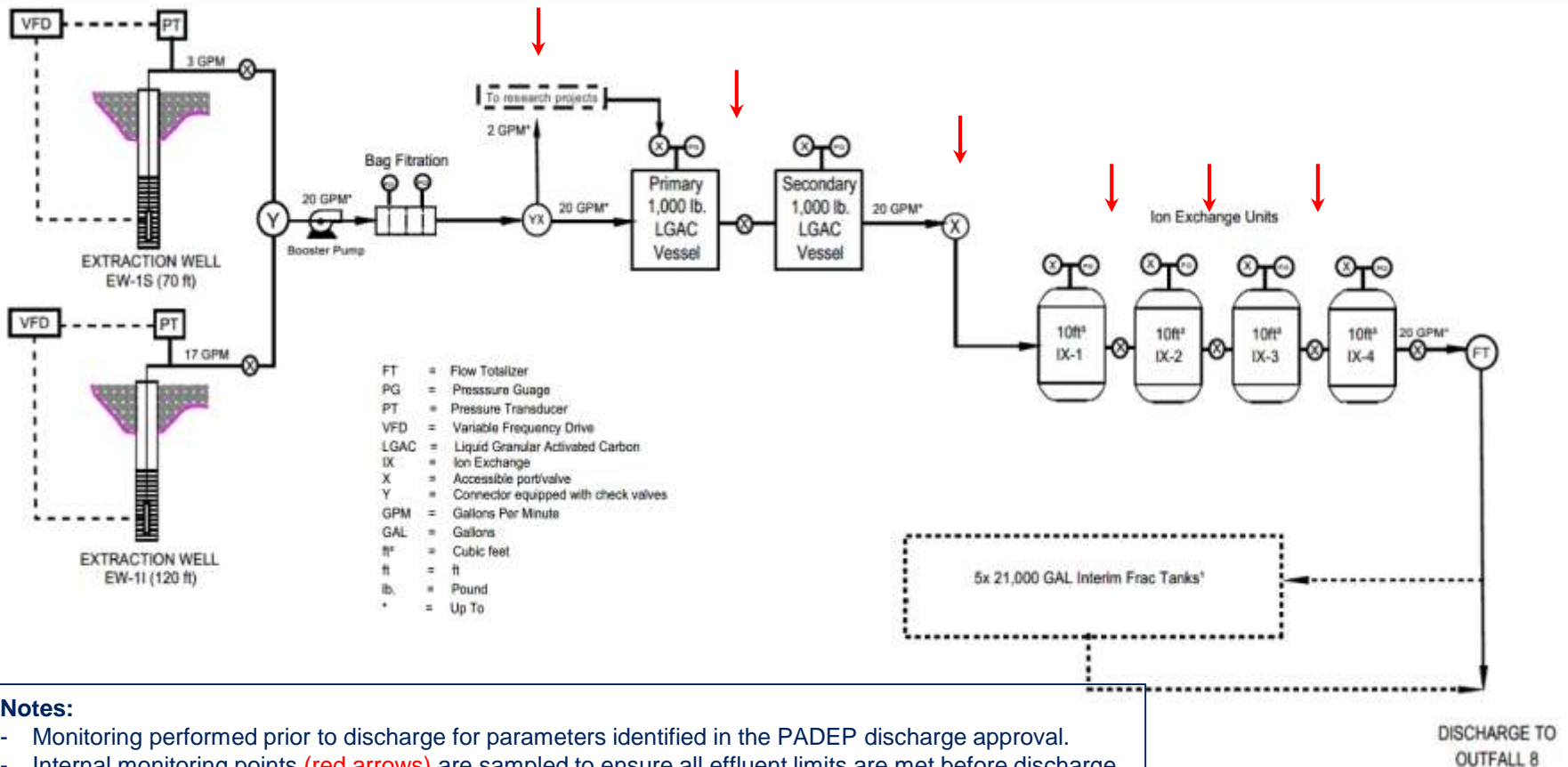


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# Pilot Test Treatment Process



Treatment Direction



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# Participation in DoD Funded PFAS Research



- SERDP/ESTCP are DoD-funded environmental research programs.
- NASJRB Willow Grove is supporting ~\$8M of SERDP/ESTCP funded research investigating new PFAS assessment and remediation technologies.
- Will continue to seek participation in additional SERDP/ESTCP work at NASJRB Willow Grove or nearby NAWC Warminster.
- Participate in other Navy or USEPA funded research.

## SERDP/ESTCP Projects and organizations leading the research:

- **Soil or Groundwater Treatment**  
12 Total Projects Participated, projects since last RAB
  - ER18-1300 –College of Wooster  
Completed pilot column study with new absorption media in March/April 2020.
  - ER18-1063 – Colorado School of Mines  
Pilot column testing of different commercial resins to commence in late June at WG
- **Passive Treatment of Storm Water**  
ER18-1230 –Oregon St. Univ.
- **Assessment of Fate and Transport of PFAS in Surface Water**  
ER19-1073 (New Start) –Academy of Natural Sciences of Drexel University  
ER19-1193 (New Start and potential participation) –Towson State University

**DoD's SERDP/ESTCP PFAS website:**  
[http://serdp-estcp-pfas.com/pfas\\_efforts/pfas\\_efforts.pdf](http://serdp-estcp-pfas.com/pfas_efforts/pfas_efforts.pdf)

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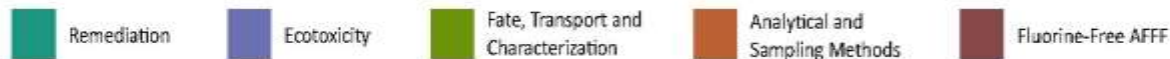


# SERDP and ESTCP Efforts on PFAS

Workshop Report:  
Long Term Mgmt of  
Contaminated  
Groundwater

Workshop Report:  
PFAS R&D Needs

Workshop on PFAS:  
Sampling, Analysis  
and Treatment



# ***PFAS Information and Resources***



**Department of the Navy (DON) Perfluorinated Compounds (PFC) / Perfluoroalkyl Substances (PFAS) website**

**<http://www.secnave.navy.mil/eie/pages/pfc-pfas.aspx#>**

**NAVFAC BRAC PMO Websites (includes links to environmental information and the administrative record):**

- [http://bracpmo.navy.mil/brac\\_bases/northeast/reserve\\_base\\_willow\\_grove/documents.html](http://bracpmo.navy.mil/brac_bases/northeast/reserve_base_willow_grove/documents.html)
- [http://bracpmo.navy.mil/brac\\_bases/northeast/former\\_warfare\\_center\\_warminster/documents.html](http://bracpmo.navy.mil/brac_bases/northeast/former_warfare_center_warminster/documents.html)

***A subscription service is available on these websites to receive e-mail notification of new information.***

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# ***PFAS Information and Resources***

*(continued)*



## **Environmental Protection Agency**

**<https://www.epa.gov/pfas>**

## **Agency for Toxic Substances and Disease Registry**

**<https://www.atsdr.cdc.gov/pfc/index.html>**

## **Pennsylvania Department of Environmental Protection**

**[http://www.dep.pa.gov/Citizens/My-Water/drinking\\_water/Pages/default.aspx](http://www.dep.pa.gov/Citizens/My-Water/drinking_water/Pages/default.aspx)**

## **Horsham Township**

**<http://www.Horsham.org/default.aspx>**

## **Warminster Township**

**<http://warminstertownship.org/information-on-perfluorinated-chemicals-pfoa-and-pfos/>**

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# ***PFAS Information and Resources***

*(continued)*



**Horsham Water and Sewer Authority**

**<https://www.horshamwater-sewer.com>**

**Warminster Township Municipal Authority**

**<https://www.warminsterauthority.com/>**

**Pennsylvania Department of Health**

**<http://www.health.pa.gov/My%20Health/Environmental%20Health/Pages/default.aspx>**

**Horsham Township Library Information Repository**

**<http://oldhtl.mclinc.org/WillowGroveNASindex.html>**

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